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WHEN FIRE IS BANISHED FROM THE LAND OF THE WHITE OAK

Prepared by the FOREST SERVICE

A STAND UNTOUCHED BY FIRE—GOOD TIMBER, GOOD REPRODUCTION, GOOD RANGE, INDUSTRY, REVENUE, BEAUTY, HEALTH

OZARK NATIONAL FOREST, ARKANSAS

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THE LAND OF THE WHITE OAK

Maine is justly famous for its spruce woods; New York for its beech, birch, and maple; the Lake States for white and Norway pines; the southern Appalachian Mountains for yellow poplar and chestnut. So we might call the roll of all the forest regions of the country and name the trees that have made each forest famous. On such a roll the Ozark Mountains of Arkansas and southern Missouri would have a place as the undisputed realm of white oak and shortleaf pine.

In Arkansas, in a vast rugged highland lying between the White River on the north and the Arkansas River on the south is **the home of the white oak.** Along this divide country, covering the headwaters of the streams tributary to the two great rivers, lies the **Ozark National Forest,** established by the Federal Government for the purpose of growing timber "for the use and necessities of citizens of the United States." The Forest Service, recognizing the supremacy of the white oak in this region, has dedicated this national forest to the task of growing **white oak timber for the Nation.**

High quality white oak can not be grown in a day, even in this land of long days and long months of sunshine and rain. But with fire banished from the woods, the leaf litter allowed to accumulate and hold the moisture, and with regular cutting operations to give room for the growth of the best trees, white oak can be grown, steadily and at a satisfactory rate. And the nation must have high-quality white oak. It needs it for wagon stock, for furniture, for flooring, and for tight cooperage and other purposes for which no other wood will quite meet the need.

Along with the white oak, as associated species, are grown hickory, cherry, black walnut, and red gum. These, with the white oak, will make up the final, permanent crop. Crowded stands, **thickets** we may call them, **are necessary** in the earlier stages of tree life to furnish later the clear, straight trunks from which we can get the "quality" product in demand by the American people. Intermediate cuttings (and revenue) will be obtained from the "fillers" which will be cut while young, after they have served the purpose of putting the quality into the main crop. Black gum, locust, beech, shortleaf pine, and several species of black oak are the principal "fillers," and from these such products as railway ties, telephone poles, fence posts, and rough lumber are obtained.

If fire can be kept out of the Ozark National Forest until a maximum production can be approached, this forest can produce a **continuous timber harvest** of at least 50 million board feet a year. At $5 a thousand feet, which is a conservative figure, this will mean a direct revenue to the Public Treasury of $250,000 a year. The national forest laws provide that 25 per cent of such revenue shall be returned

for road and school purposes directly to the counties within which the forest is situated. An additional 10 per cent is expended each year by the Forest Service in bettering local roads and trails.

Timber production alone fails to picture completely the usefulness of this "Land of the White Oak." The timber harvest means **employment** too; labor at fair wages for the men in near-by towns, and for the farmers in their off seasons. It means **permanent and profitable industry,** markets for the produce of farm and garden, business for local merchants. It means progressive communities, offering advantages for social contact and development, and educational opportunities for the boys and girls who soon must take on the duties and obligations of good American citizenship.

Good roads already traverse this pleasant, productive region, and will assuredly be extended year by year. Trails and telephone lines likewise penetrate the forest depths and do their part in building a more intimate and healthy community life and spirit.

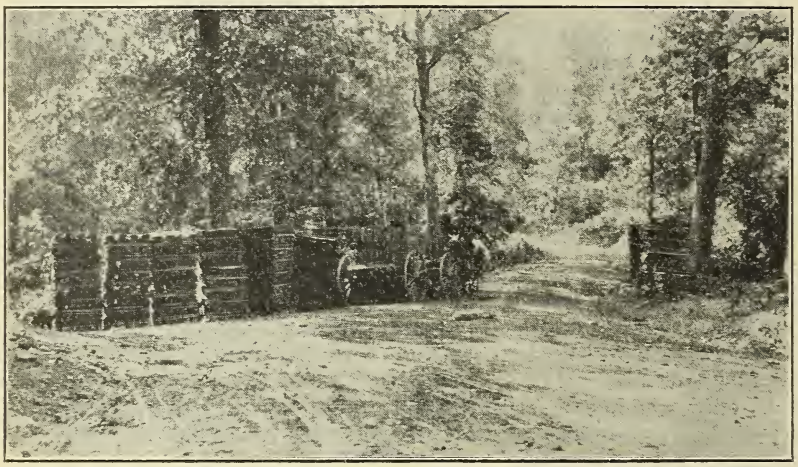

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FIG. 1.—Stave yard on improved national forest road. Sand Gap. Ozark National Forest

Good range for the farmer's cattle is a natural by-product of the well-protected, productive hardwood forest. The open stands of such a forest promote the growth of the better forage plants in excellent variety and generous quantity, while the forest shade protects the stock from sun and storm.

Game in the thickets, **fish** in the streams, **bird life** in all its beauty and variety, once so abundant in these Ozark hills, can be restored if the forest is protected.

For the **purest of water** in ample supply the growing populations of northwest Arkansas must look more and more to the forested watersheds of the Ozarks. That they will not look in vain is one promise of the forested hills.

For all so fortunate as to live to visit there, the "Land of the White Oak" has a distinctive charm. The luxuriance of growth and variety of trees and shrubs in the hardwood forest appeal to the imagination and satisfy the human craving for the out of doors. In the spring, while the leaves are budding, and the sap is starting up,

the woods flowers cover the ground and the flowering dogwood, the azalea, and the redbud burst their winter confines and cover the hills with glorious beauty and color. In the fall, the dry leaves crunch beneath the feet, the red and black gum and maple leaves color a gorgeous, striking red, and the white oaks add a touch of pink against a background of yellow and brown supplied by the mass of trees.

FIRE IN THE WOODS

To derive the full benefit of the resources of this "Land of the White Oak" requires a sustained, constructive effort, in which every adult citizen, every boy and girl of the region, can lend a hand. The work is now under way, in the hands of the small force of forest officers of the Ozark National Forest. It goes steadily forward, year by year, impelled by faith in the future and by the consciousness of a truly worth-while purpose, but handicapped and hampered

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FIG. 2.—Productive forests mean permanent industry. Mill and yard in Ozark National Forest

by one ever-present problem, the solution of which depends largely upon the local citizens, individually and as a people.

This one big problem is fire in the woods. Year after year, in spring and in fall, more than 100 fires threaten with devastation this treasure house of natural public wealth. Almost all of them are deliberately set by men who do not realize that timber has become a most valuable land crop; who can not or will not see the irreparable damage that these fires do and the drain upon the public funds that they entail, or who care nothing for the rights of other individuals and of the community when weighed against some immediate personal advantage or an opportunity to "square" a personal grudge.

Woods fires are a public menace. They violate the moral law which obligates us to leave this world a better rather than a worse place for those who come after us. They rob the Nation, the State, and every local taxpaying citizen just as surely as though they

reached directly into his pocket and took therefrom the contents of his purse. They must be banished now and forever if the "Land of the White Oak" is to serve mankind as it was intended.

THE CASE AGAINST FIRE

DAMAGE TO STANDING TIMBER

Settlers and lumbermen who have worked in the hardwood timber in the Ozarks know only too well what is meant by pinworms, bunchworms, flagworms, grubworms, and soak and butt rots, and how great is the loss of timber due to them. Damage by insects and rot is to be found in connection with practically every fire scar on the base of a tree in this forest. The fire may have occurred 50 or 100 years ago, and all signs of it may have been hidden by later growth, but during the two or more years that it took the tree to heal over

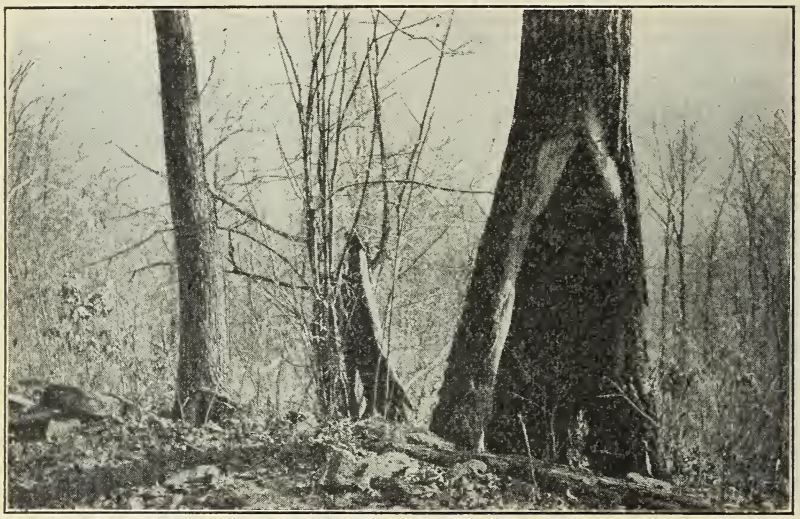

FIG. 3.—Three trees in various stages of destruction by fires. Heavily burned ridge. Ozark National Forest

the scar, worms and spores, or germs, which produce rot in trees, entered at this open wound on the butt, and, in the case of the rots, have been at work ever since, gradually destroying the timber in the trunk.

Any little pile of leaves and other trash which wind and water may have left lodged against the base of a tree, will, when dry and set on fire, produce sufficient heat to cook and kill the bark and sapwood for several square inches on the butt. The injury thus caused is apparently slight, but in reality the damage done may continue during the entire life of the tree, and may finally cause its death. It is mainly through such small fire scars that the rots get into the trees.

The spores, or "seed," of the tiny fungous plants which cause the rot fall on the dead spot or fire scar, sprout during damp weather, and grow into the heartwood of the tree. Once in the heartwood, the little plants use part or all of the wood as food, and thus gradually

destroy the sound timber, producing what is called "rot," "dote," or "soak" in the trunk of the tree. The small fire scar may, and usually does, heal over, so that in a few years no evidence of a fire or injury to the tree can be seen from the outside; but the rot continues to grow for years, slowly spreading outward until it reaches the sapwood, and upward in the trunk, thus ruining the tree for most commercial purposes.

Every time a tree is reached by fire hot enough to kill a small area of the bark and sapwood, an opportunity is given for more worms to enter and for another attack by the little plants which produce rot. Where trees are growing on steep slopes, small piles of trash accumulate on the upper side at the base. In such cases even a light fire burns this pile of trash and a fire scar is formed. On the side of Pilot Mountain are dense stands of young oak saplings, from 2 to 6 inches in diameter, every one of which has a fire scar on the upper side of its base, due to the burning of these piles of trash. This

FIG. 4.—The forest frequently burned. Timber destroyed by windfall and rots. Forage plants lacking

means that a large number of these saplings will grow into trees having butt rots and worm holes in the trunks. Similar conditions can be seen on nearly every mountain side in the Ozark National Forest.

Anyone passing through a stave sale area after all the good bolts have been removed, must have noticed the large quantity of cull left on the ground. Oftentimes an entire tree has failed to yield even a single bolt. Why was this so? Because worms, rot, or soak had ruined the tree for staves before it was cut. Cull butts from 6 to 16 feet in length have not been uncommon on many areas where the timber had been felled. In nearly every case these butts were left on account of rot. Practically all this rot was caused by fires which injured the bases of the trees.

The loss of good merchantable timber in a stave operation from rot and worms is enormous. On one stave sale area, examined a few years ago, 76 out of every 100 trees felled had butt rot, and 27 trees

in every 100 had worms of some kind in them. What does this mean? It means that after the expense of felling 100 trees, only 24 of them were found to be perfectly sound and suitable for staves. Not only was there a money loss from the cull of 76 trees, but the expense of felling unsound trees must be considered. For five widely separated areas in the eastern part of this forest, the examination revealed that an average of 65 trees in every 100 had butt rot, and 26 had worm holes sufficient to cull some of the bolts.

Most of this loss can be traced directly to the fires so common in the Ozark National Forest. The area where 76 trees in every 100 were found to have butt rot had been burned over regularly for years. On areas where fires had not been so frequent, the injury from butt rot was correspondingly less. The loss of timber in stave operations from worms and rot alone will often average one-fourth of the total amount of material actually used for staves. It is for this very reason that stave men in buying private timber offer such low prices; they do not know until the timber is felled and worked up just how much loss there will be from worms, soak, and rot; they do know, however, that the loss will be great. The loss from worms and rot caused by fires is not confined to white oak, but extends to red and black oaks as well. Old fire scars on the butts of these trees are the usual places where many wood-boring insects enter the tree. On some areas as many as 33 trees out of every 100 red and black oaks felled had been injured by grubworms. The usual butt rots of white oak are also found in the other oaks, and fire scars are the places through which they enter.

Another way that fires injure standing timber is by burning through sound bark and sapwood into the hollow butts. Once the hollowed-out interior of the tree is exposed to the air, the rot which originally caused the hollow seems to grow up the tree more rapidly and other fires that follow gradually widen the hollow and destroy the bark at the base of the tree until the tree is killed. A tree with an open, hollow butt is much more easily blown down than one in which the hollow is inclosed by living bark and sapwood.

Thus, in three principal ways, **fires damage standing timber**—by producing fire scars through which worms enter, by opening a passage through the bark and sapwood for rot to reach the heartwood, and by weakening trees with hollow butts till they either burn down, die from fire girdling, or are blown over by strong winds. Every fire, therefore, increases the damage by making a new crop of worms in the trees and by giving giving another chance for rot to enter.

DAMAGE TO YOUNG GROWTH

The fires that scar the mature trees, admitting worms and rots, kill the tender seedlings and so injure saplings and other immature forest growth as to prevent their development into valuable timber trees. The woods of the region bear evidence, mute but undeniable, that on areas where recurring fires have taken their toll there is no young growth or reproduction worthy of the name coming on to replace the veterans when their span of life has ended. Scrub thickets, and then rocky barren slopes are the ultimate results of repeated fires.

Without protection from fire, timber production on a profitable scale is impossible. No one will buy worthless timber. Not only is it worthless of itself, but by its very presence in the forest it increases cost of lumbering and decreases stumpage values of such timber as is sound and usable. Without thrifty young growth the forest is obviously doomed.

DAMAGE TO WATERSHEDS

In the Ozarks, or elsewhere, to whatever extent the mountain watersheds are shorn of their forest cover, and particularly wherever repeated fires destroy the layer of leaves and mulch and the surface vegetation, to just that extent is the soil exposed to the destructive action of sun and heavy rain. No longer does it hold and conserve the moisture, feeding it in clear regular supply to the springs and water courses. Instead it washes rapidly away with every heavy rain, until nothing is left but bare rock. Floods and dry channels follow each other at frequent intervals; valley streams and navigable rivers become clogged with silt and débris; navigation is obstructed; and domestic and municipal water supplies become unreliable and impure. We need not go to the deforested regions of China, that land of flood and famine, to learn this simple lesson. On many an Ozark hillside, subjected to repeated fires, we may observe at least the beginnings of this sorry process.

LOSSES AND DAMAGES

Revenues	Lost.
Industry	Stagnant.
Business	Inactive.
Labor	Unemployed.
Community development	At a standstill.
Schools	Unsatisfactory.
Social life	Restricted.
Population	Decreasing.
Range	Deteriorating.
Fish and game	Driven out.
Beauty	Sacrificed.

Men and women, boys and girls of the Ozarks: Look about you. Some or all of these drawbacks to your happiness and prosperity are so evident that all must see them.

REMEDYING PRESENT CONDITIONS

A century of experience has proved beyond question the futility of attempting to convert this mountain forest into fields of grain and cotton. Timber and its by-products are the crops that the "Land of the White Oak" can produce and should produce in sufficient quantity to make this a land of prosperity, contentment, and progress.

To-day we find the sale of timber from the Ozark National Forest practically stopped for a 5-year period; revenues consequently almost nothing; the hum of forest industries stilled; the market for surplus labor of farm and town almost closed; the lumbering pay rolls insignificant; schools with terms too short, equipment inadequate, and teachers underpaid; the children consequently handicapped for life; the young folks moving out to sections which offer better immediate opportunities and advantages; the cattle ranges poor, with the pea

vine and other valued forage plants giving way to worthless weeds or barren rocks; good fishing rare; good hunting hard to find; and on all sides areas where the natural beauty of the Ozark hills has been replaced with scenes of desolation.

Why do such conditions exist in a land so richly endowed? Look and think! The only answer is **Fire!** The case against fire is complete and undeniable.

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FIG. 5.—Building fire lookout tower—Pilot knob. The arrival of the first load of lumber at the summit. This is said to be the first vehicle ever to reach the top of Pilot Mountain

Are such conditions to continue, and grow worse—robbing everyone now living and the generations to come of the advantages, prosperity, and happiness that the timber crop would bring? **No! Then banish fire from the woods!**

Fire, of course, is but the agent or servant of man. **Not fire** but the **one who turns it loose** in the woods must be held accountable

to and by the injured people. Already the great majority of the people of the Ozarks appreciate the damage that fires have done and are doing. The duty of the good citizen is clear, his opportunity is

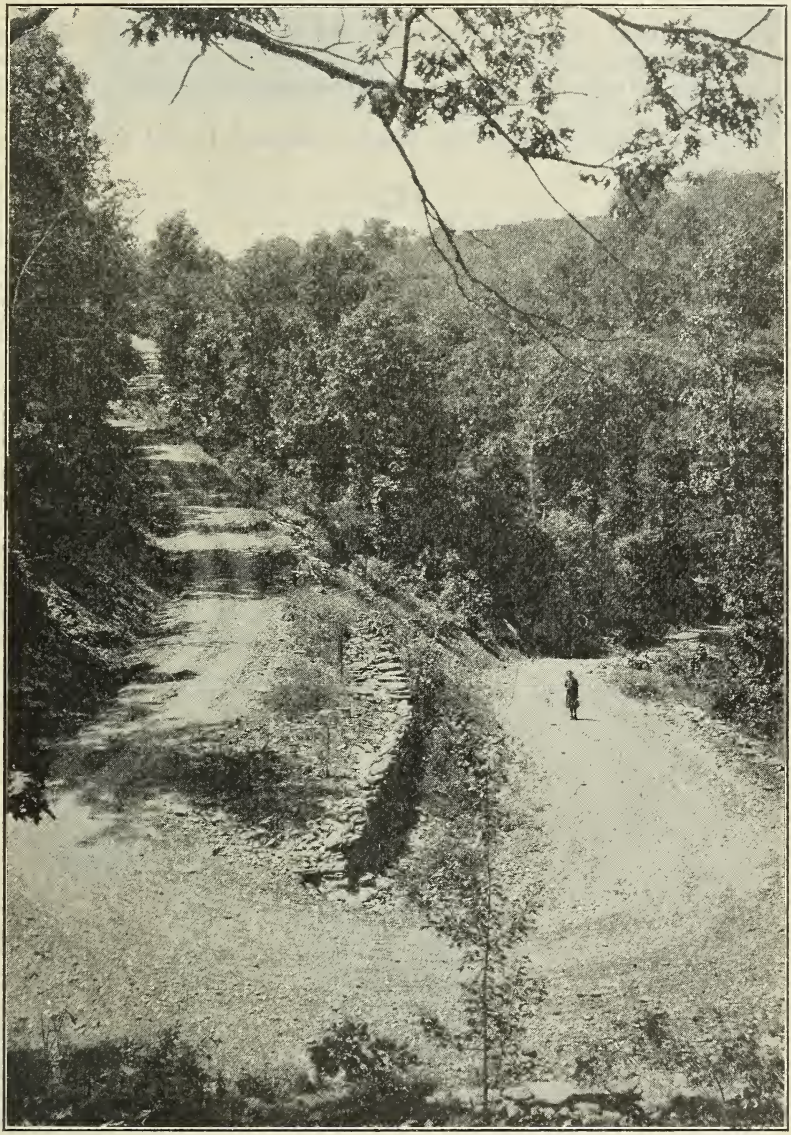

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FIG. 6.—The "Hairpin," near the north boundary. Ozark National Forest

now. Let him actively help to convert the few who would still burn the woods, and, the effort toward conversion failing, let him unite with his neighbor and the public servants who guard this public property to drive the woods burner from the Ozark hills.

In this way, and not without such public and personal cooperation, can the "Land of the White Oak" fulfill its purpose of producing wealth in wood, permanently and bountifully, and giving joy to the thousands who will respond to the call of its natural beauty and attraction.

Do your part. If you find a fire, do all you can to extinguish it. Notify the forest officers. Above all throw the weight of your own active good citizenship into the drive against those who would burn and destroy this forest heritage.

The forest supervisor of the Ozark National Forest is located at Russellville, Ark.

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